MACH 7 AR2788S REFRIGERANT RECOVERY / RECYCLE / EVACUATION AND RECHARGE UNIT

Meets new EPA regulations.

Certified by ITS to meet SAE J2788 standard.

Certified by ITS to meet High Voltage Compressor Service per SAE J2788 standard.

OPERATION MANUAL

Models: AR2788S, AR2788SE, AR2788J

Unit Consists Of:

- AR2788S Series Mach 7 Automotive Refrigerant Recovery / Recycling / and Recharge Machine
- Vacuum pump
- Recovery Cylinder - AR2788S USA 50# DOT tank. Tanks must be purchased seperately on models AR2788SE and AR2788SJ. 90# DOT tank available
- Low and High side service hoses
- Low and High side R-134a Couplings
- Removable oil injection system
- Two virgin tank high side transfer hose adapters: One ¼ SAE Female, One ½ ACME Female
- Low Side Charging Adaptor
- 41 cubic Inch CPS filter drier
- Tank filter bracket w/ hardware and all tank Hoses
- 1# (454 gram) check weight
- Operation manual

End user to provide:

- R134a Refrigerant
- Refrigerant oil and/or dye for injection system

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AR2788S Specifications			
Models	AR2788S	AR2788SJ	AR2788SE
Compressor Type	1/3 HP reciprocating compressor		
Dimensions	22" W x 24.5" D x 42" H		
Weight	120 lbs (does not include tank weight)		
Operating Range	10˚C (50˚F) to 49˚C (120˚F)		
Power Source	115 VAC 60Hz 1Ph	100 VAC 50/60Hz 1Ph	220-240 VAC 50/60Hz 1Ph
Power Consumption	500 W		
Low Side Gauge	-30 inch Hg to 125 PSIG		
High Side Gauge	0 to 500 PSIG		
Filtration	41 cubic inch drier, .7 micron oil separator		
Automatic Control Valves	Motorized ball valves to control HI, LO, recover, and vacuum		
Charging Valve	12 VDC Solenoid Valve		
Construction	1" Heavy duty tubular frame construction 10" pneumatic wheels, 4" swivel casters		
Overload Protection	15A Thermal Breaker	15A Thermal Breaker	10A Thermal Breaker
High Pressure Shut-Off	30 bar (450 psig)		
Refrigerants	R134a		

INTRODUCTION

Thank you for purchasing the CPS Mach 7 AR2788S series unit. CPS is dedicated to give you the fastest and most reliable equipment to meet all your mobile A/C service requirements. In doing this CPS has integrated its latest technology and incorporated state of the art features while improving reliability and speed under the new SAE J2788 Standard. The AR2788S is also designed to meet or exceed the new SAE J2788 standard for High Voltage Compressor Service. This SAE Standard was developed in conjunction with the United States EPA and SAE to enhance the speed and to recover more refrigerant from the A/C system.

The AR2788S is a R-134a Refrigerant Handling machine. The AR2788S automatically recovers, recycles, evacuates, and recharges a mobile A/C system. Simply hook up the service hoses, choose the desired operation, and allow the unit to automatically complete the service.

The AR2788S utilizes a single pass (oil coalescing and moisture removal) recycling system, which means that whenever the AR2788 recovers it also recycles. The unit also incorporates automatic air purge to remove unwanted non-condensable gasses from the refrigerant. Thus the refrigerant storage tank always contains the cleanest refrigerant possible for future recharge use.

The Mach 7 AR2788S utilizes CPS's exclusive patent pending Hi-Flow Smart Valves. The Hi-Flow Smart Valves are unique to the industry in that they will not be affected by sealants, particulates, and other contaminants. The Smart Valve incorporates passage ways 8-15 times larger than the existing solenoid valve orifice technology. In fact the AR2788S uses no solenoid or check valves in the active flow path of the recovery/recycling and vacuuming system.

The following are additional features:

- Multiple storage drawers for tools, test equipment, spare filters, etc….
- Integrated Manifold Gauge Set. Visually see how the mobile A/C system is operating. No manual valves to open of close
- Large Graphic LCD to view operating instructions. Languages include English, Spanish, French, German, Chinese and more
- A highly accurate electronic charge scale
- Microprocessor Integrated mass flow system keeps track of how much refrigerant has run through the filter drier giving the user maximum amount of run time on each filter. 150 LBS per filter
- Cartridge type 41 inch cubic filter drier. Mounted directly on the storage cylinder for maximum accuracy
- Automatic high-pressure shut-off with microprocessor indication
- Interchangeable CPS Recovery cylinders. Use your country's approved refrigerant cylinders. The software allows the user to set up the proper tank and refrigerant parameters. Larger cylinders, such as CPS CRX390T, can be used for larger truck and bus A/C systems.
- Modular design for easy replacement of a defective plumbing, scale, electronic, compressor or vacuum pump sub system
- Heavy-duty construction: Powder coated steel cabinet mounted onto a 1" tubular steel frame
- 10" pneumatic rear wheels and 4" swivel casters give this unit excellent maneuverability under the worst of conditions
- Recovers and Evacuates through both the high and low side service hoses
- Separate Vacuum pump for faster evacuations
- Additional service hose lengths available, 8 foot comes standard
- Programmed electrical outlet for optional heater blanket installation

To help you get a good start, please continue to carefully read the balance of this manual. This manual contains important information on the proper procedures for operating this equipment. Please pay close attention to the safety information, Warnings, and Cautions provided throughout this manual. Always remember "Safety First".

Certified by ITS to meet or exceed SAE J2788 (USEPA required) standard and the SAE J2788 High Voltage Compressor service provision.

GENERAL SAFETY INSTRUCTIONS

Only qualified service personnel should operate this unit. Most states, countries, etc… may require the user to be licensed. Please check with your local government agency.

DANGER- this unit's recovery tanks contains liquid refrigerant. Overfilling of a recovery tank may cause a violent explosion resulting in severe injury or even death. Do not disable the overfill safety features. Always make sure the correct tank is on the scale.

DANGER- Only use the recovery tanks provided with this unit. See distributor for replacement tanks.

DANGER- Avoid breathing refrigerant vapors and lubricant vapor or mist. Breathing high concentration levels may cause heart arrhythmia, loss of consciousness, or even cause suffocation.

DANGER- Electrical shock hazard!!!! Always disconnect power source when servicing this equipment.

CAUTION- all hoses may contain liquid refrigerant under pressure. Contact with refrigerant may cause frostbite or other related injuries. Wear proper personal protective equipment such as safety goggles and gloves. When disconnecting any hose, please use extreme caution.

CAUTION- avoid breathing refrigerant vapors and/or lubricant mist. Exposure may irritate eyes, nose, throat, and skin. Please read the manufacturers Material Safety Data Sheet for further safety information on refrigerants and lubricants.

CAUTION- do not use this equipment in the vicinity of spilled or open containers of gasoline or other flammable substances. Make certain that all safety devices are functioning properly before operating the equipment.

CAUTION- to reduce the risk of fire, avoid the use of extension cords thinner than NO. 18 awg. (1,5mm^2). The following table references extension cord wire size vs. maximum length:

WIRE GAUGE	**MAXIMUM LENGTH** (feet)
18	10
16	25
14	50

CAUTION- do not use this equipment in the vicinity of spilled or open containers of gasoline or other flammable substances. Make certain that all safety devices are functioning properly before operating the equipment.

CAUTION- This equipment should be used in locations with mechanical ventilation that provides as least 4 air changes per hour or the equipment should be at least 18" above the floor.

CAUTION- RISK OF INJURY, the equipment should only be operated by certified personnel.

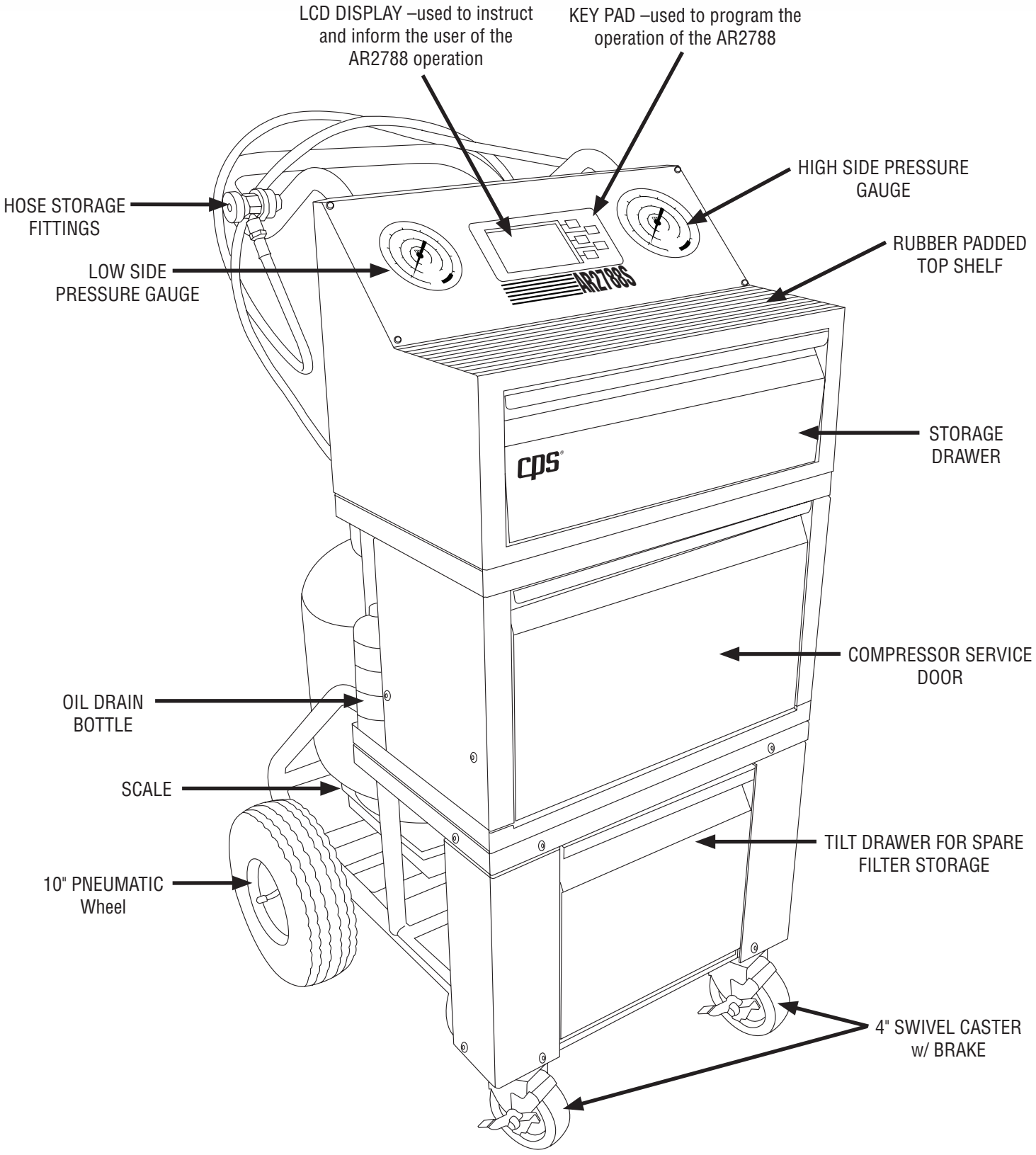
CAUTION- The unit is intended for use with one refrigerant, R-134a. Mixing of different refrigerants will cause this equipment and the mobile A/C system to prematurely fail.

CAUTION- Use only CPS certified hose assemblies on this unit. The hose assemblies are made to proper length, contain shut offs where required and have direct affect on the proper operation of this equipment.

DANGER- DO NOT USE COMPRESSED AIR TO PRESSURE TEST OR LEAK TEST THE UNIT OR VEHICLE AIR CONDITIONING SYSTEM. Some mixtures of air and R-134a refrigerant are combustible at elevated pressures. These mixtures are potentially dangerous and may result in fire or explosion causing personal injury or property damage.

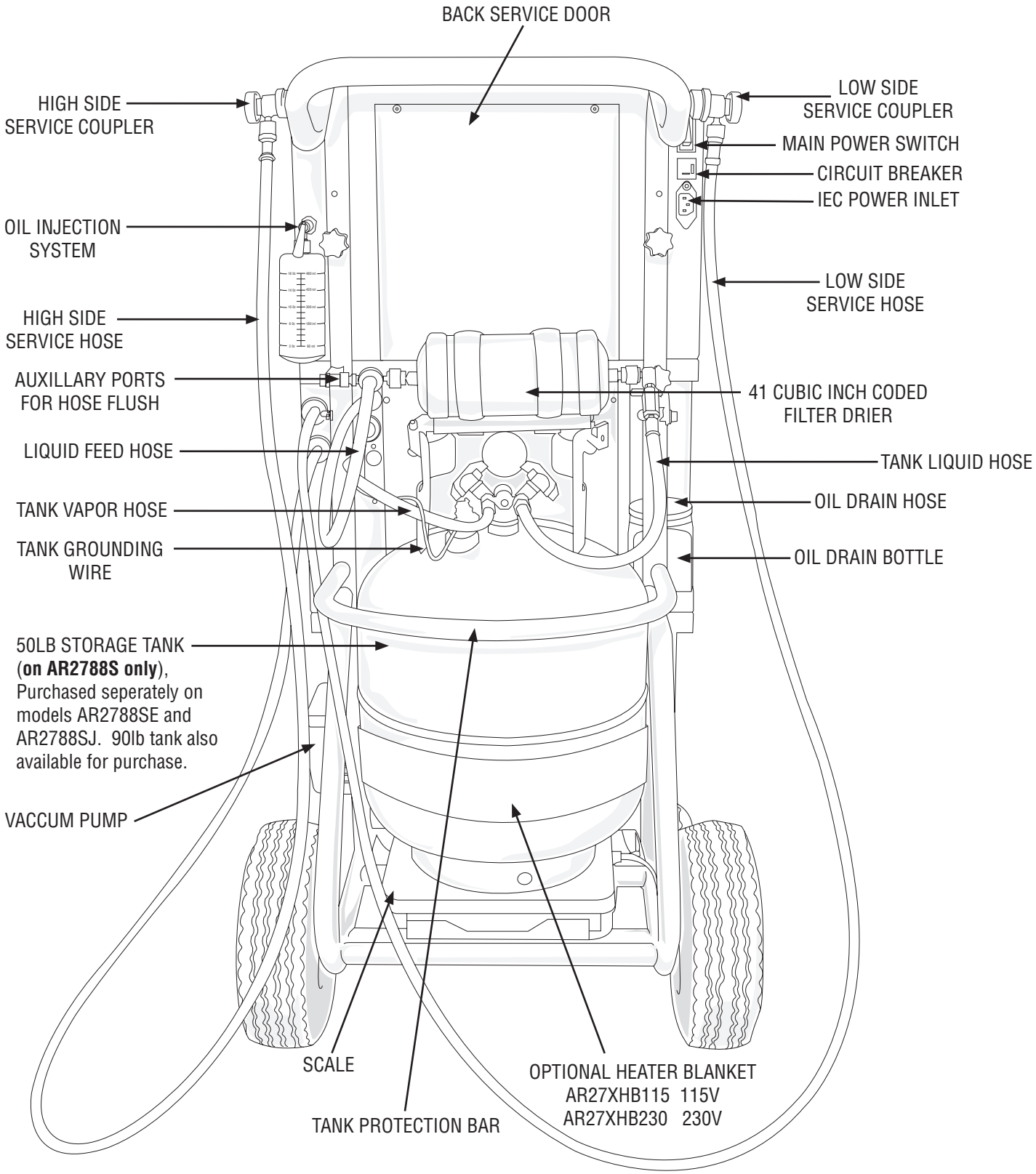
REFRIGERANT WARNING- USE THIS UNIT WITH R-134a REFRIGERANT ONLY. The unit is designed to recover, recycle, and recharge only R-134a refrigerant. Do not attempt to adapt the unit for another refrigerant. Do not mix refrigerant types through a system or in the same container, mixing of refrigerants will cause severe damage to the unit and the vehicle air conditioning system.

AR2788S Front Layout


LCD DISPLAY –used to instruct and inform the user of the AR2788 operation
KEY PAD –used to program the operation of the AR2788
HIGH SIDE PRESSURE GAUGE
HOSE STORAGE FITTINGS
RUBBER PADDED TOP SHELF
LOW SIDE PRESSURE GAUGE
AR2788S
STORAGE DRAWER
cps
COMPRESSOR SERVICE DOOR
OIL DRAIN BOTTLE
SCALE
TILT DRAWER FOR SPARE FILTER STORAGE
10" PNEUMATIC Wheel
4" SWIVEL CASTER w/ BRAKE

UNIT LAYOUT

AR2788S REAR LAYOUT



AR2788S INITIAL EQUIPMENT PREPARATION

1. Carefully unpack the **AR2788S** and its contents from its shipping pallet. If unit is not equipped with tank, go to **Step 3**.
2. If equipped with CPS provided tank, remove the Styrofoam pads around the tank, tank shipping support strap, and the shipping bracket between the tank and scale platform as shown in **Fig 1 (a)**. Cut the shipping band around filter.
3. If the unit does not come with a tank, place an approved refrigerant recovery cylinder onto the platform. Center so that the cylinder does not touch the frame or sheet metal of the unit.

a. Install Filter Bracket onto cylinder as shown in **Fig 2a**. Secure filter bracket to tank collar **(a-b)**.

b. Install Filter onto bracket as shown in **Fig 2b**. Secure filter on bracket with velcro straps **(a)** and make sure the arrow on the filter label is pointing to the left **(b)**.

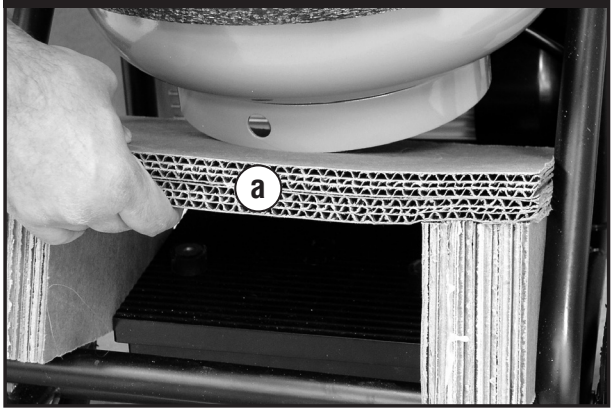
c. Install refrigerant hoses as shown on **Fig 2c**. Connect liquid feed hose to the filter drier outlet **(a)** then connect the tank liquid hose to the filter drier inlet **(b)** continue on connecting the discharge hose to vapor port **(c)** and the liquid hose to liquid port **(d)** and finish by connecting the ground wire clamp to the tank **(e)**.

4. Open top storage drawer.

The contents are as follows:

- Two 6' power cords, (1) USA 115 Volt, (1) 230V Schuko
- Operation manual
- Two virgin tank transfer hose adapters:
  ¼ SAE – R134 high side adaptor
  ½ ACME – R134 high side adaptor
- Low side charging adaptor
- 1lb. calibration weight

FIGURE - 1

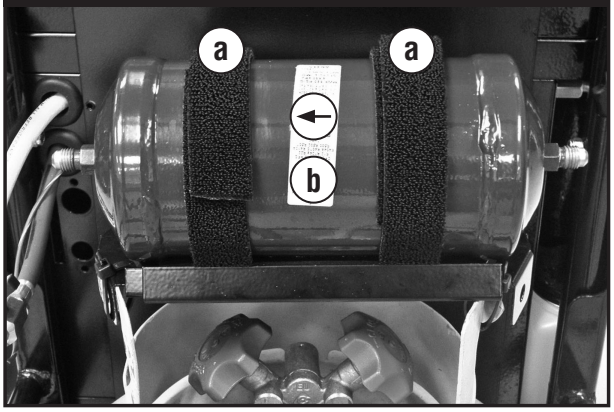


Shipping bracket

FIGURE - 2a

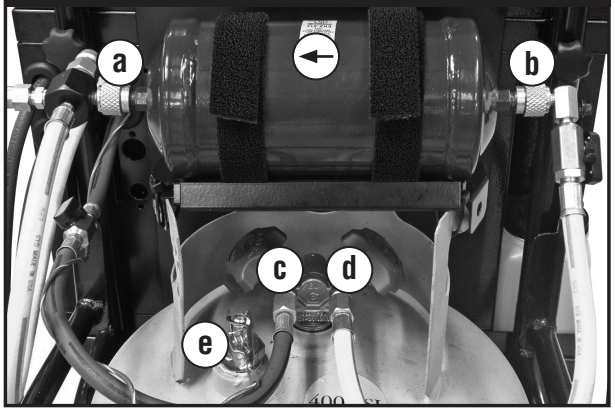
Filter bracket placed on tank collar

FIGURE - 2b



Filter placed on filter bracket

FIGURE - 2c



Hose routing between filter, tank, and unit

AR2788S INITIAL EQUIPMENT PREPARATION

7. Check Vacuum Pump oil level per the sight glass built into the vacuum pump oil sump. The Vacuum Pump is pre-filled at the factory. If required, add additional oil to the Vacuum Pump. Make sure the vacuum pump power switch is in the “ON” position. Also, check that the vacuum pump hose is properly connected and the vacuum pump power cord is securely plugged into the receptacle in the vacuum pump switch panel. If equipped, make sure the vacuum pump voltage switch is set to the nameplate rating of the unit.

8. The next step is to set up the AR2788S defaults. Plug the unit into power supply. Hold down Key 3 (**See Fig-5**) while turning on Main Power switch. The LCD will come up asking for language selection. Choose the preferred default language. For future language changes, hold down Key 1 while turn Power on.

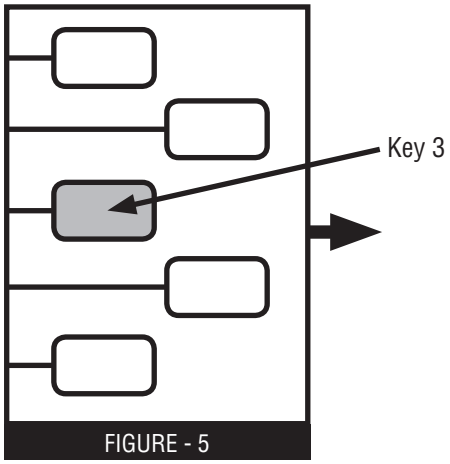
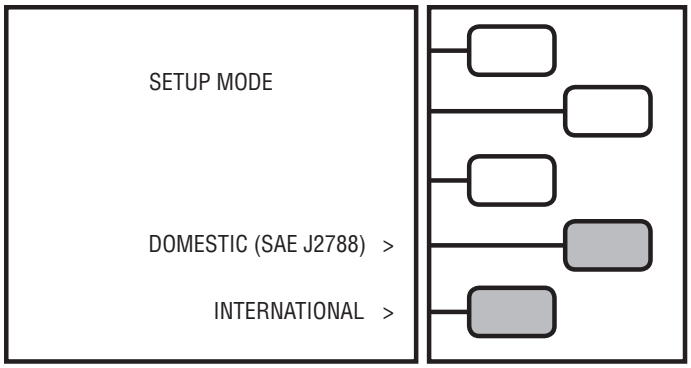
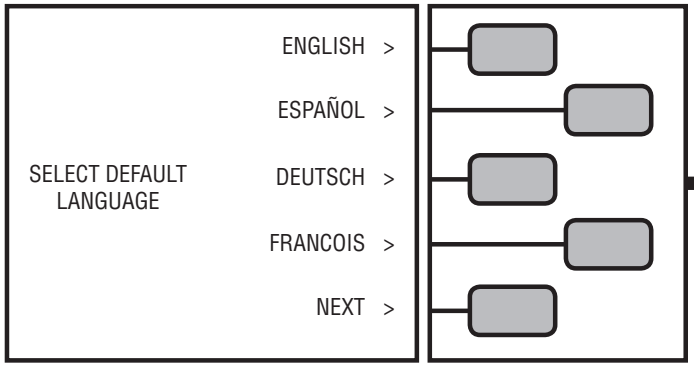


FIGURE - 5

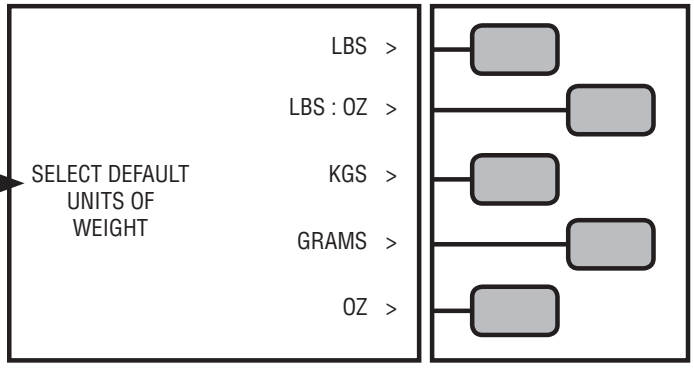
The LCD will now read:
Select regional operational default by selecting either DOMESTIC (SAE J2788) or INTERNATIONAL. Consult local, state and federal laws or regulations for proper selection. DOMESTIC is required by USEPA for use in USA.



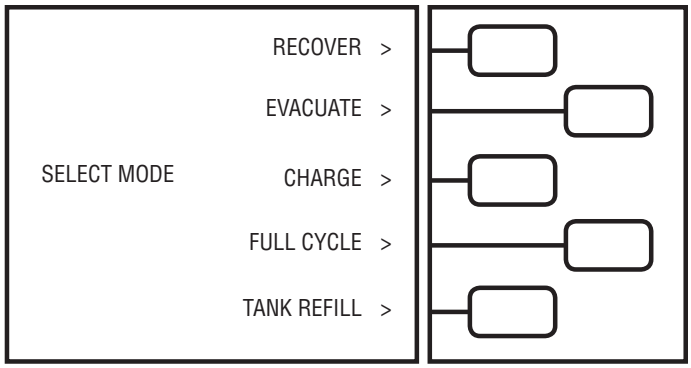
The LCD will now read:
Push the language choice key.



The LCD will now read:
Push the desired Units of Weight key.



The unit will then proceed to do the automatic PT calibration and Air Purge if required. Once complete the LCD will go to the **MAIN MENU**.



9. The AR2788S is almost ready for its first service. Final step is to add new Refrigerant to the storage tank. From the Main Menu, push the TANK REFILL key. Connect the High Side Service hose to a virgin supply tank. Is will be one of the two virgin tank transfer hose adapters provided with the unit. Following the instructions on the LCD screen. See Page 16 for further tank refill instructions.

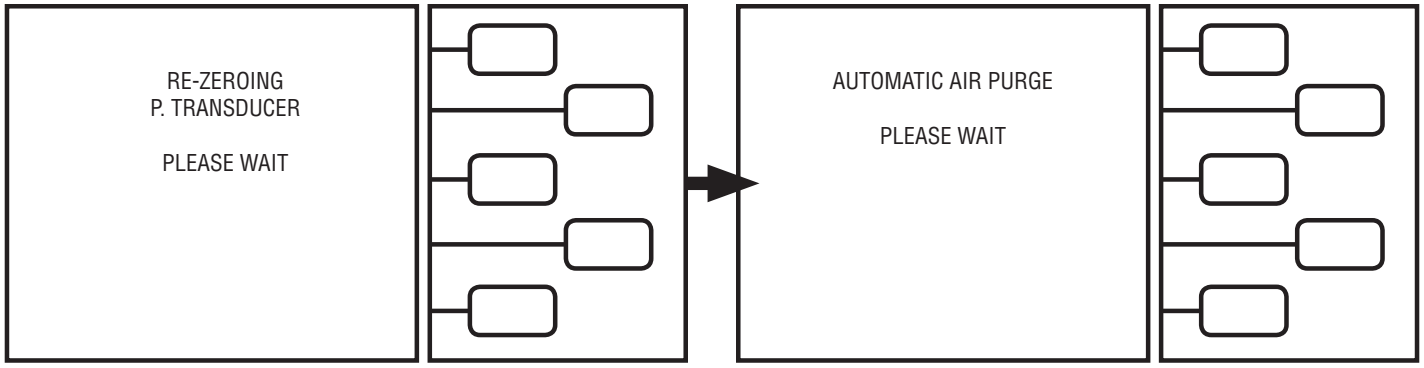
Congratulations, the Mach 7 model AR2788S series is now ready for service use. Please refer to the rest of this manual for proper operating instructions.

IMPORTANT: BEFORE USING THIS START UP GUIDE IT IS HIGHLY RECOMMENDED THAT THE USER COMPLETELY READ AND UNDERSTAND THIS ENTIRE MANUAL. FAILURE TO OPERATE AS SPECIFIED COULD RESULT IN DAMAGE TO THE UNIT, WHICH COULD ALSO LEAD TO LOSS OF WARRANTY.

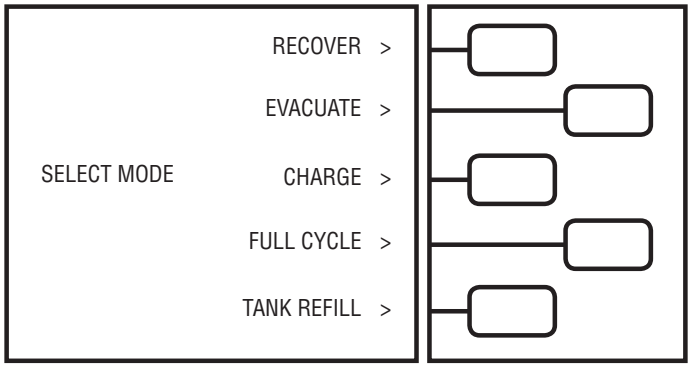
The AR2788S is a microprocessor driven unit. The operating instructions are contained on the LCD. Simply choose the desired function of the unit and follow the directions on the LCD. The following are the basic instructions on safely operating each function of this unit.

Start Up Guide

Open all Storage Tank Valves. Turn the Power switch to "I" (On) position. The unit will run a brief diagnostic routine. LCD will read: **RE-Zeroing PT, Please wait**. Once done with PT calibration process, the unit will proceed to the automatic air purge sequence. This will take up to 3 minutes.



The LCD screen should now read: This is called the **MAIN MENU**.



- Connect the refrigerant service hoses to the automobile A/C system to be serviced.
- Open the High and Low side service couplers.
- You can run the automobile A/C system and determine operating pressures.

Push the **KEY** for the desired mode.

The different modes are as follows:

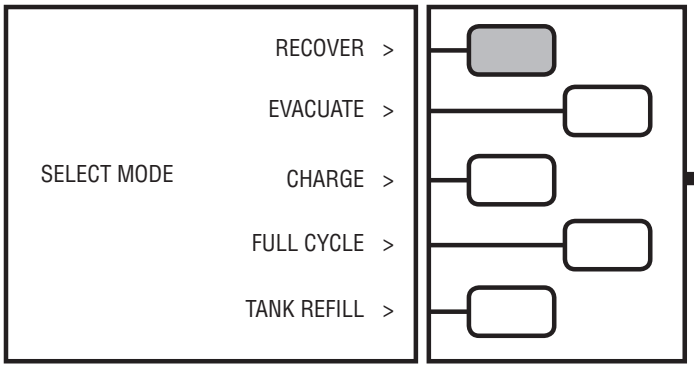
1. Recover
2. Evacuation (Vacuum)
3. Charge
4. Full cycle
5. Tank refill

Follow the directions on the LCD for each mode. The following pages will discuss the operation of each mode in detail.

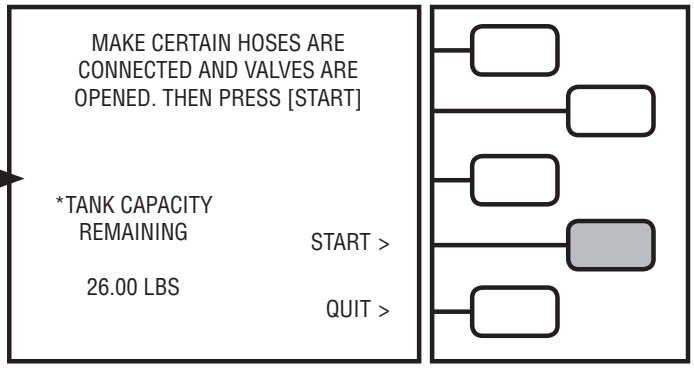
AR2788S OPERATION MODES

1. RECOVER / RECYCLE MODE: The Recover/Recycle mode would be chosen to recovery refrigerant from an Auto A/C system that needs a refrigerant containing component replaced such as a compressor, evaporator, orifice tube, condenser, etc….
IMPORTANT: Before running the RECOVERY /RECYCLING operation, a portable Refrigerant Identifier should be used to check the refrigerant in the automobile A/C system to prevent cross contamination. ***See Refrigerant Warning on page 4 for further details***

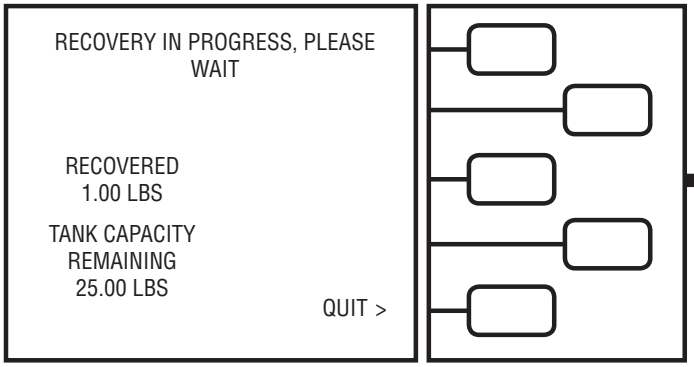
From the Main Menu screen,
Push the **RECOVER** key.



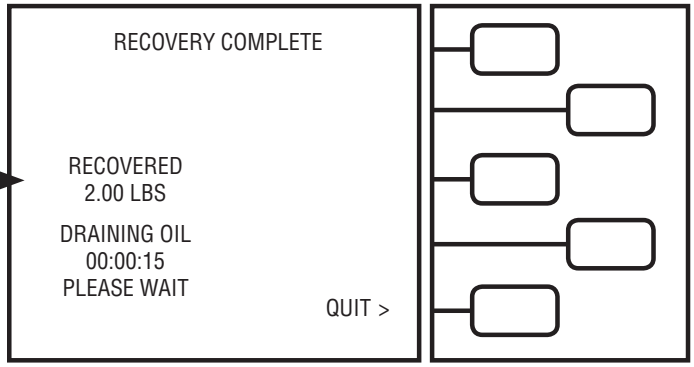
The LCD will now read:
Push the **START** key.



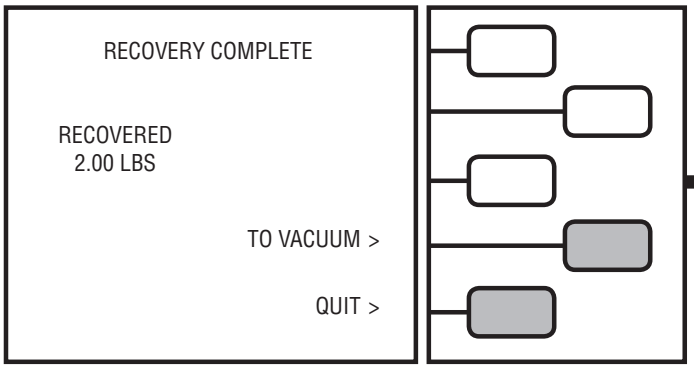
The LCD will now read:
The AR2788S is now recovering refrigerant.
The LCD will show the amount of refrigerant recovered.

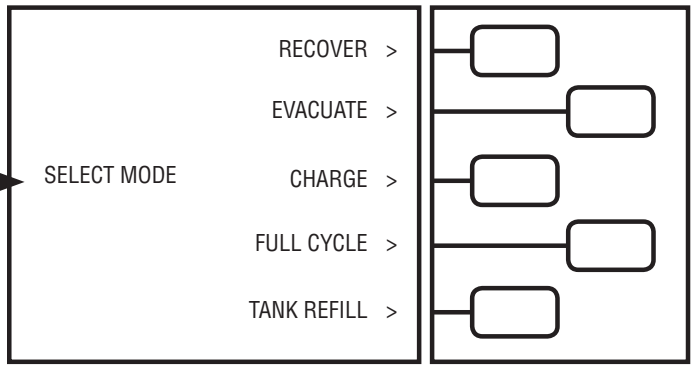


When the AR2788S reaches approximately 20" hg. vacuum.
The LCD will now read.
The AR2788S will proceed to drain the recovered oil:



Record the **RECOVERED** weight reading on the LCD. Push the **QUIT** key to return to **Main Menu** (as shown below) or **PROCEED TO EVACUATE** key for evacuation operation. Do not forget to measure the A/C oil in the oil drain bottle for future A/C oil re-injection. **RECOVER/RECYCLE** Operation is now complete.

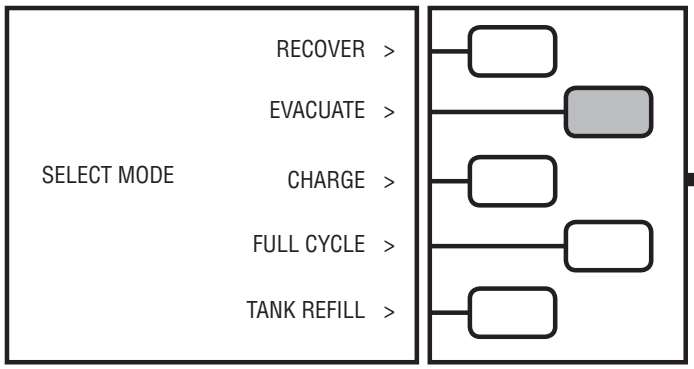




* TANK CAPACITY REMAINING - is the amount of space available in storage tank.

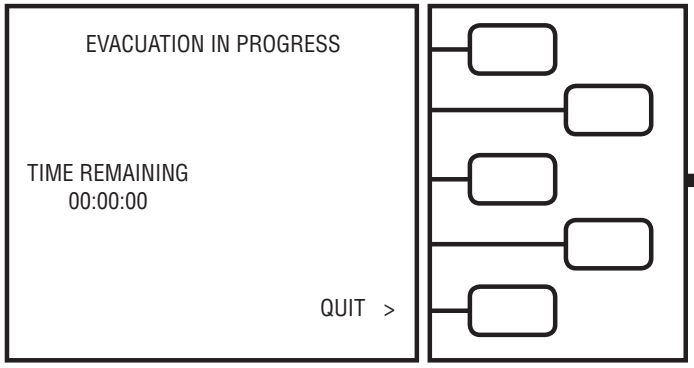
2. EVACUATE MODE: The EVACUATE Mode would be chosen to remove air and moisture from an Automobile A/C system that has been open to the atmosphere. **CAUTION: Air and moisture in an A/C system can cause premature failure of A/C system components.**

From the Main Menu screen,
Push the **EVACUATE** Key



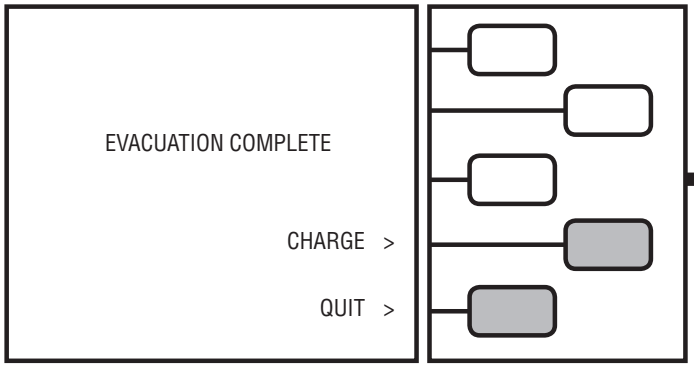
The LCD will now read:
Push the + or – ARROW keys until the desired vacuum time is programmed. Once done, push the **START** key.

The LCD will now read:
The vacuum pump will run until the **TIME REMAINING** reaches 00:00



The unit will then proceed to a 2:00 minute leak check test.
The LCD will now read:

If leak check fails, check A/C system for leaks.
If leak check passes
The LCD will now read:



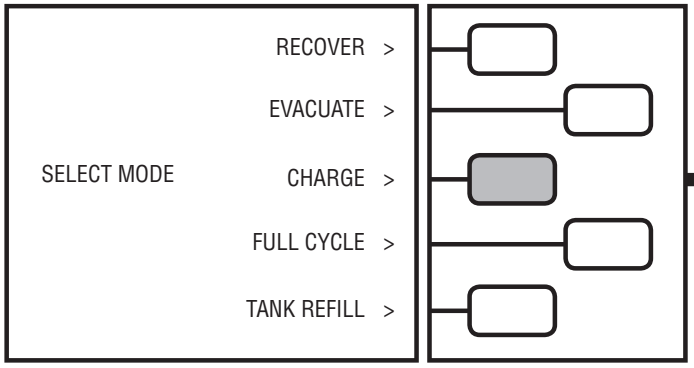
Push the **QUIT** key to return to Main Menu or **CHARGE** key for charge operation.

NOTE: If a leak is detected, the LCD will be prompted.

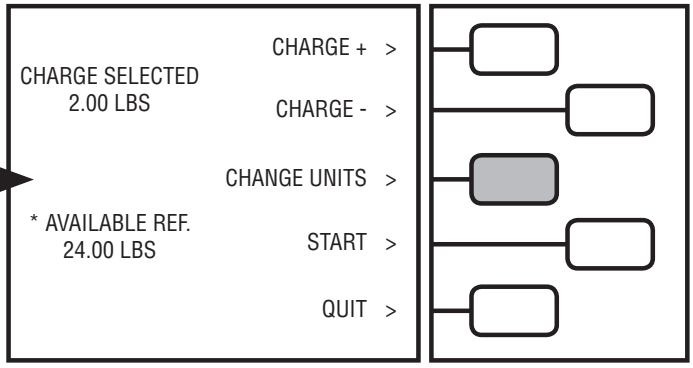
AR2788S OPERATION MODES

3. CHARGE MODE: The CHARGE mode would be chosen to recharge a mobile A/C system after it has been properly evacuated. This is also the time to inject oil back into the A/C system. **See special instructions on page 21 for High Voltage Compressor A/C system charging.**

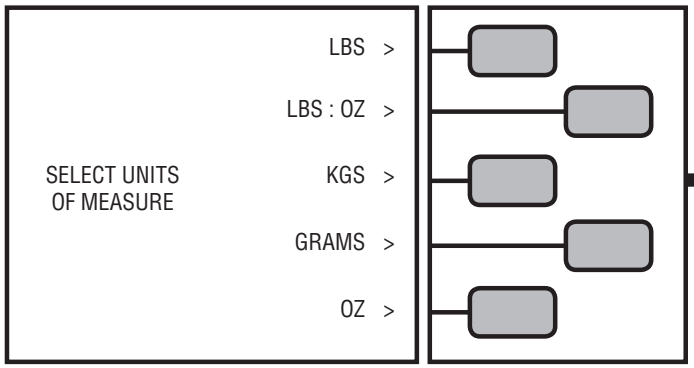
From the Main Menu screen,
Push the **CHARGE** key.



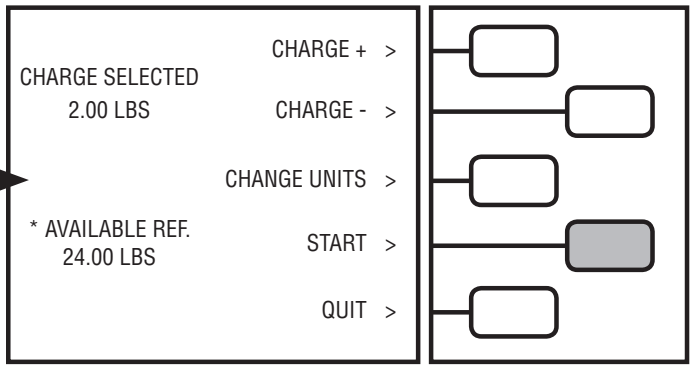
The LCD will now read:
If desired, the units of measure can be changed at this time.
Push the **CHANGE UNITS** key.



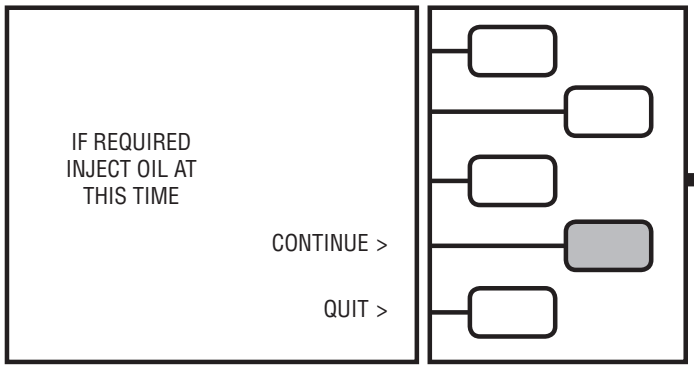
If the **CHANGE UNITS** key is pushed,
The LCD will now read:
Select the required units of measure.



Continue by pushing the + or - ARROW key until the charge amount is programmed. Once desired amount is programmed, push the **START** key.



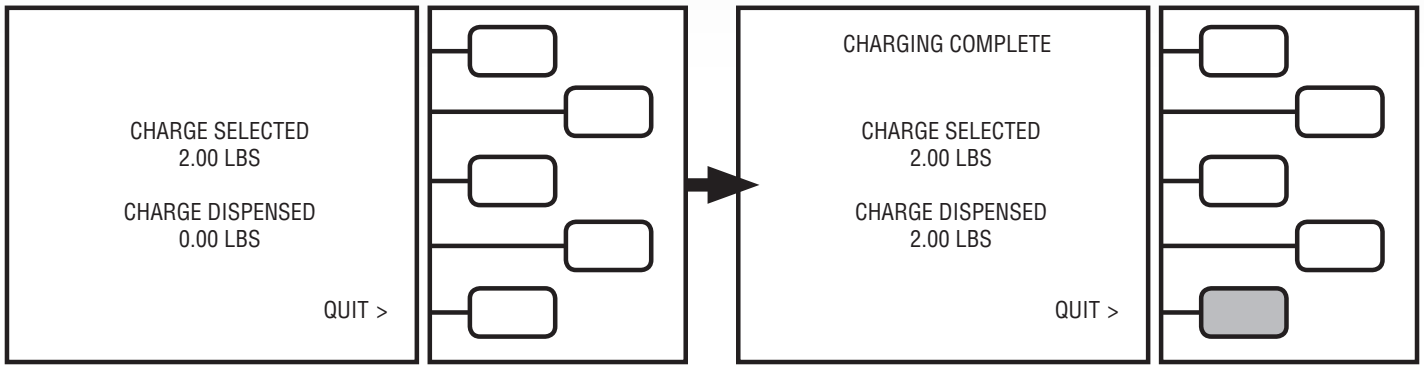
The LCD will now read:
Open the oil injection valve until the desired amount is dispensed.
Push the **CONTINUE** key once injection is complete.



* AVAILABLE REF. This is the amount of refrigerant available for charging. If this drops below zero, charging will not start.

The LCD will now read:
The **CHARGE DISPENSED** reading will begin to increase.

Once the CHARGE SELECTED is reached, the LCD will now read:
Push the **QUIT** key. The LCD will return to the MAIN MENU



Hose Purge Procedure:

STEP 1: Once the AR2788S LCD shows **Charging is complete**. Disconnect both service hoses from the mobile A/C system.

STEP 2: Using the **LO** Side charging adaptor, reconnect the **HI** side service hose to the **LO** Side service port on the mobile A/C system.

STEP 3: Start mobile A/C system. Allow the pressure in the **HI** side service hose to drop to **25-40 PSIG**. This can be read on the **HI** side gauge.

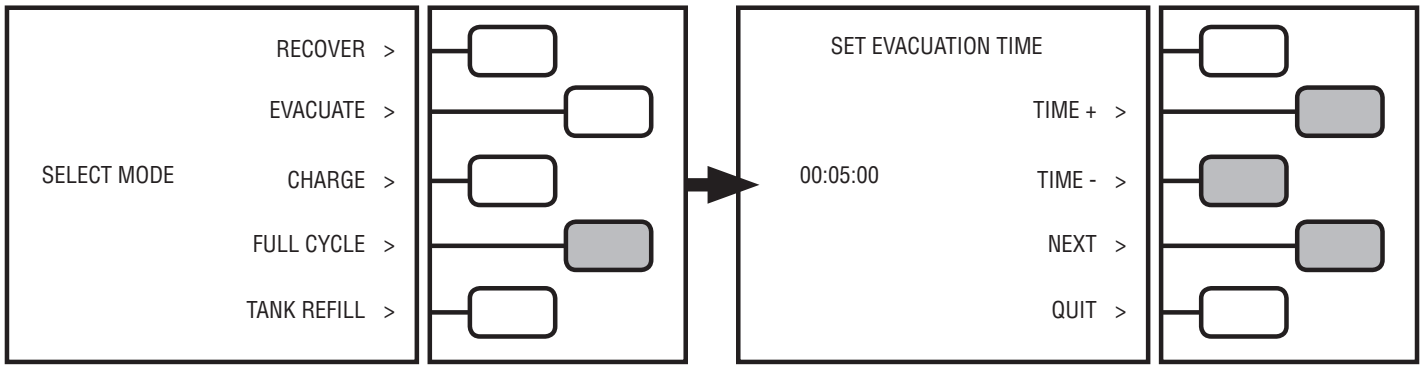
STEP 4: Once achieved, disconnect **HI** side service hose from mobile A/C system **LO** side service port. **Charge is now complete**.

NOTE: Failure to follow the Hose Purge Procedure will result in an undercharge condition of 15-40 grams.

4. FULL CYCLE: The fully automatic mode is commonly used at quick car care service facilities where no leaks or repairs are required, but the A/C system seems to be undercharged. ***IMPORTANT: Before running the FULL CYCLE operation, a portable Refrigerant Identifier should be used to check the refrigerant in the automobile A/C system to prevent cross contamination.***
See Refrigerant Warning on page 4 for further details

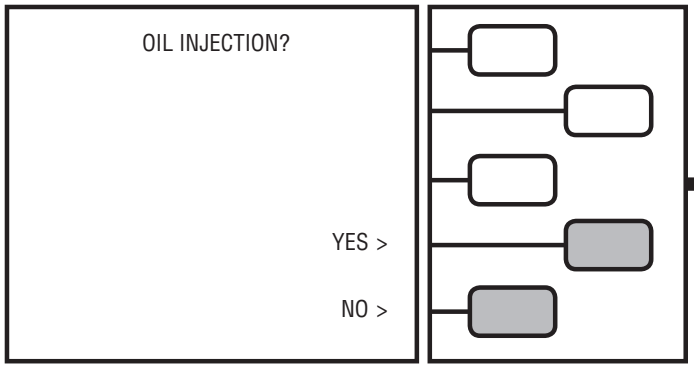
From the **MAIN MENU** screen,
Push the **FULL CYCLE** key.

The LCD will now read:
Push the + or - ARROW keys until the desired vacuum time is programmed. Push the **NEXT** key.

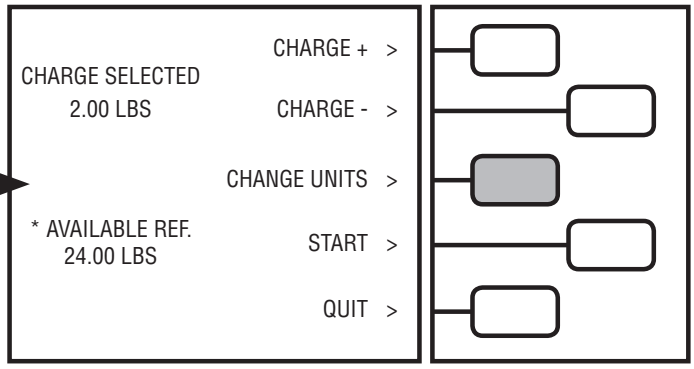


AR2788S OPERATION MODES

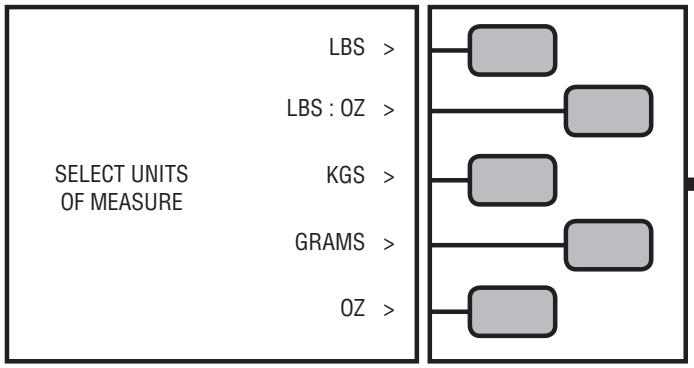
The LCD will now read:
If oil injection is required, push the **YES** key.
Otherwise push the **NO** key. If the YES key is pushed, you will be notified when to inject the oil.



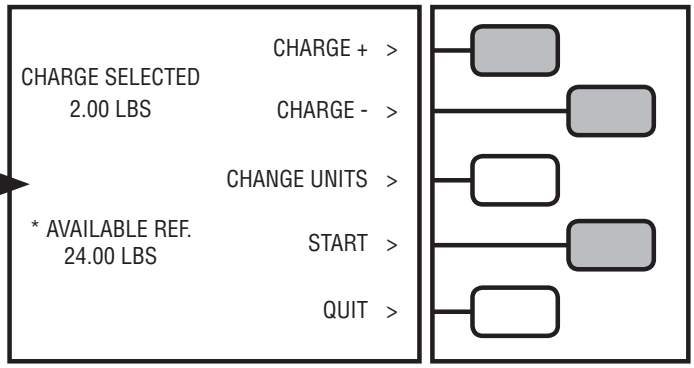
The LCD will now read:
If desired, the units of measure can be changed at this time.
Push the **CHANGE UNITS** key.



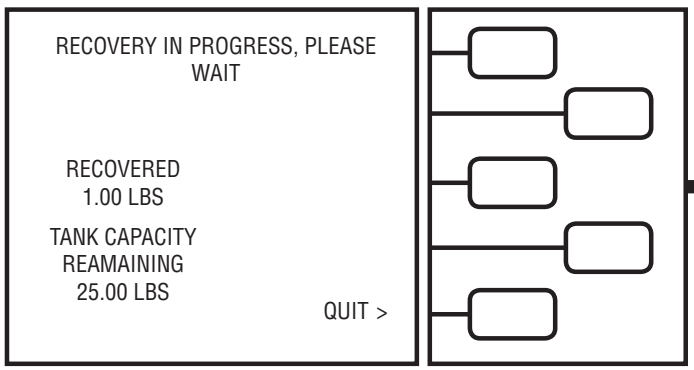
If the **CHANGE UNITS** key is pushed,
The LCD will now read:
Select the required units of measure.



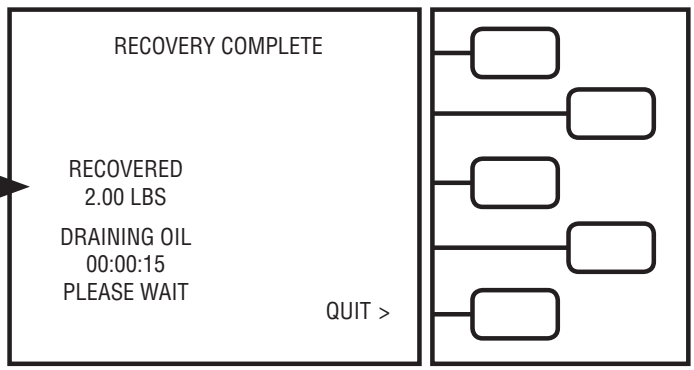
The LCD will now read:
Continue by pushing the + or - ARROW key until the charge amount is programmed. Once desired amount is programmed, push the **START** key



The LCD will now read:
The AR2788S is now recovering refrigerant.
The LCD will show the amount of refrigerant recovered.

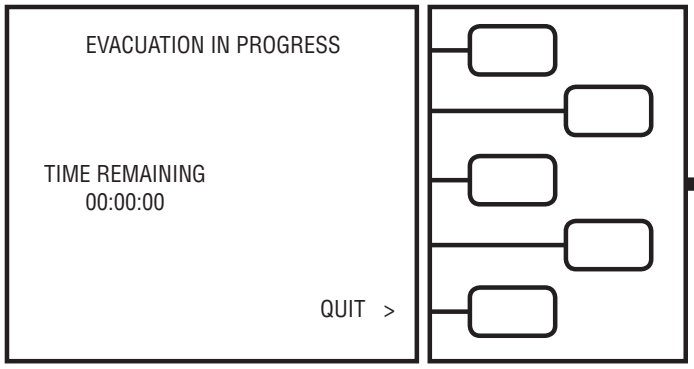


When the AR2788S reaches the required vacuum level, the unit will proceed to drain the recovered oil:
The LCD will now read:

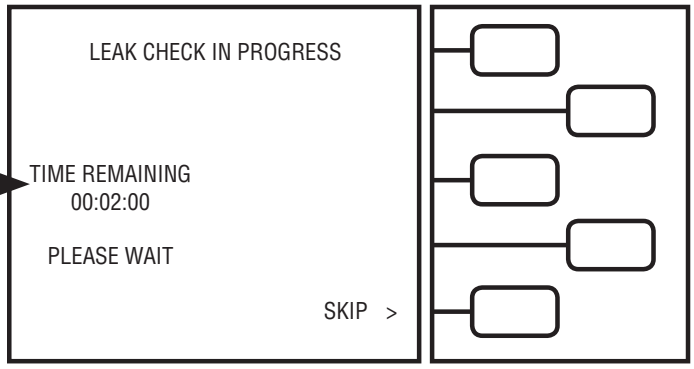


* TANK CAPACITY REMAINING - is the amount of space available in storage tank.

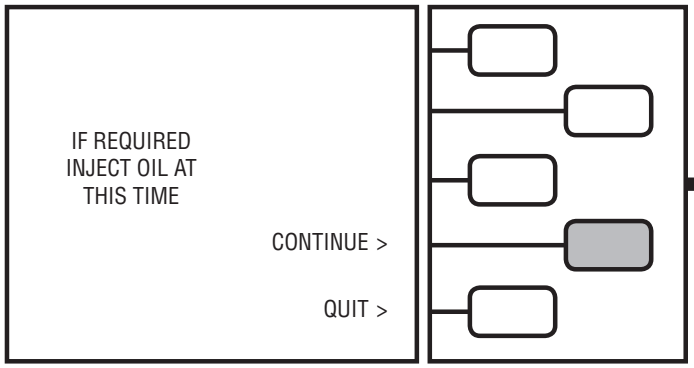
Once **DRAINING OIL** is complete, the unit will proceed to **Evacuation**. The vacuum pump will run until the **TIME REMAINING** reaches **00:00**.
The LCD will now read:



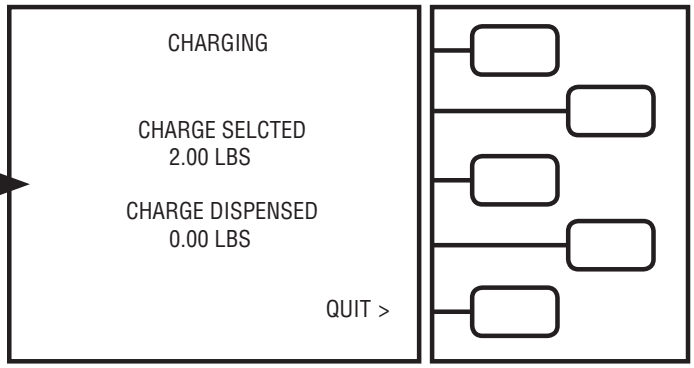
The unit will proceed to a 2:00 minute leak check test.
The LCD will now read:
NOTE: If leak check fails, check A/C system for leaks.
The **FULL CYCLE** process will be aborted.



Once the **LEAK CHECK** has passed or the **SKIP** key is pushed, The LCD will read: Open the oil injection valve until the desired amount is dispensed. Push the **CONTINUE** key

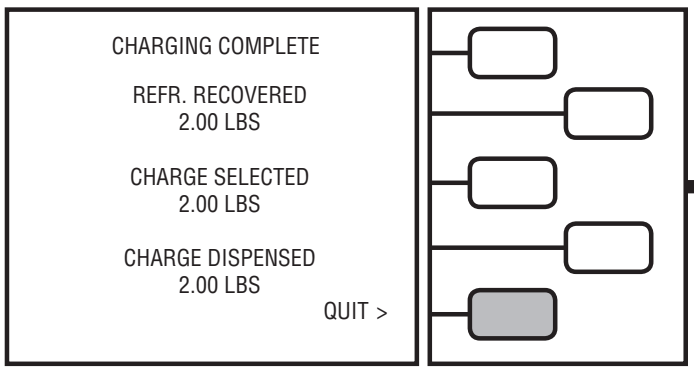


The LCD will now read:
The **CHARGE DISPENSED** reading will begin to increase.

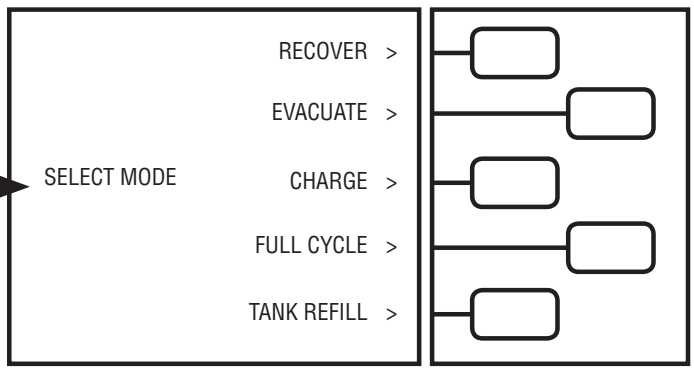


See Figure - A on page 12 for further details on the oil injection system.

Once the charge amount has been met, The LCD will read:
Follow the Hose purge procedure on Page 13.
Record the data on the LCD. Push the **QUIT** key.
FULL CYCLE is complete.



The LCD will return to the main menu.

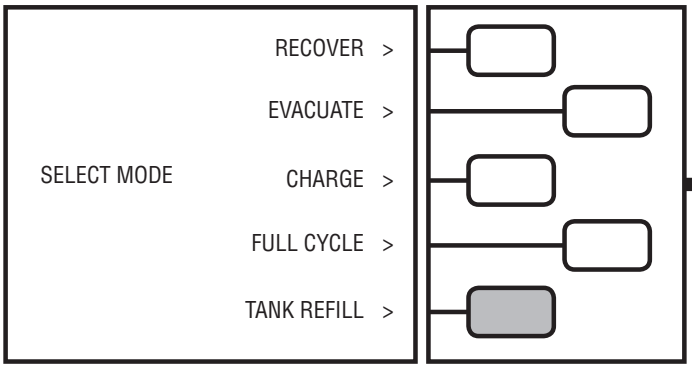


* AVAILABLE REF. This is the amount of refrigerant available for charging. If this drops below zero, charging will not start.

AR2788S OPERATION MODES

5. REFILL MODE: The REFILL mode would be chosen to add more refrigerant to the recovery tank. This operation can be run pushing the **TANK REFILL** key from the **Main Menu** or maybe prompted when insufficient refrigerant exists when in **CHARGE** or **FULL CYCLE** modes.

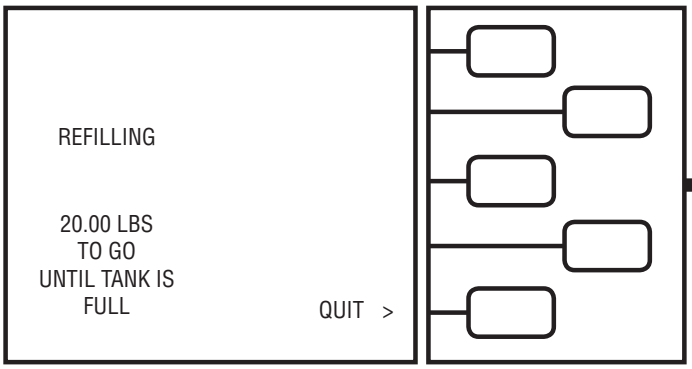
From the **MAIN MENU**,
Push the **TANK REFILL** key.



The LCD will now read:
Connect the High Side service hose to a virgin supply tank.
Push the **START** key.

Note: To speed up the Refill process, turn the supply tank upside down or make sure the liquid refrigerant is being recovered.

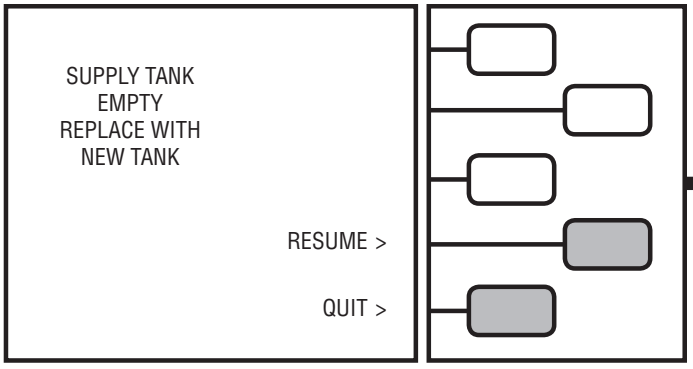
The LCD will now read:



If **REFILLING** amount reached zero, the LCD will read:
Push the **Quit** Key to return to Main Menu.

The unit will run until: 1. REFILLING amount on LCD reaches zero or 2. Virgin supply tank is pulled into a vacuum

If Virgin supply tank is pulled into a vacuum,
the LCD will read:
Either add a new Virgin supply tank and push **RESUME** or
Push the **QUIT** key to return to Main Menu.



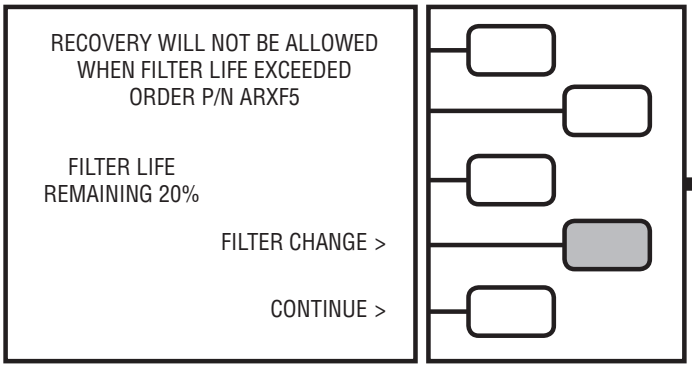
Pushing the **QUIT** key will return to the main menu.

MAINTENANCE MODES: DURING NORMAL OPERATION OF AR2788S

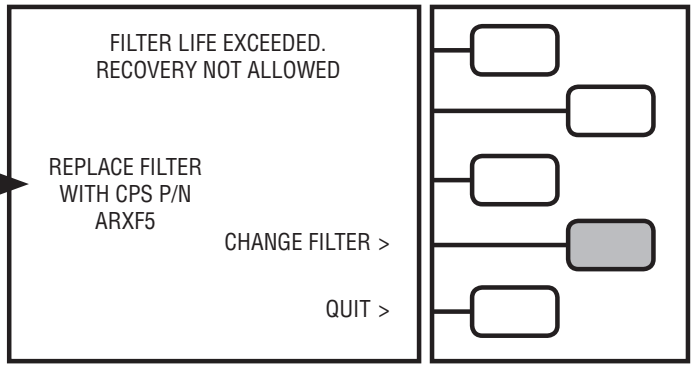
FILTER CHANGE: The AR2788S uses a mass flow tracking system on how much recovered refrigerant has passed through the Filter Drier (CPS p/n ARXF5). Each 41 Cubic Inch Drier can handle 150 lbs. of refrigerant before requiring change. When it is determined that the filter has exceeded the 150 lbs., the unit locks out the recovery function in both RECOVERY and FULL CYCLE. It is necessary to purchase a Filter Drier under CPS p/n ARXF5. Each new Filter Drier comes with a unique code to unlock the recover/recycle function. The AR2788S has a lower tilt drawer design to hold 2 spare filters.

When choosing the RECOVER or FULL CYCLE modes, the AR2788S will remind the user to order a filter when the FILTER LIFE REMAINING is below 25%.

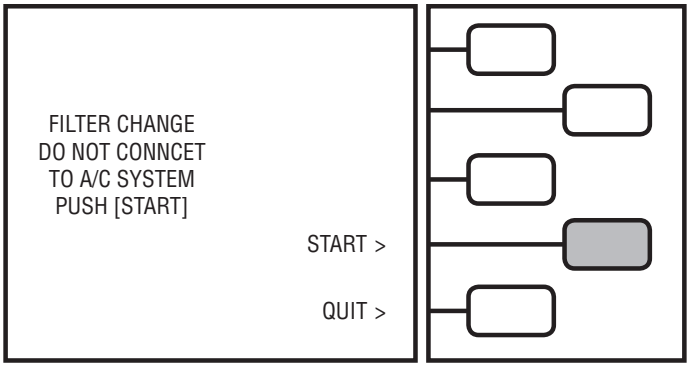
The following is an example of the LCD when Filter Life is less than 25%: Push the **CONTINE** key to proceed to filter change.



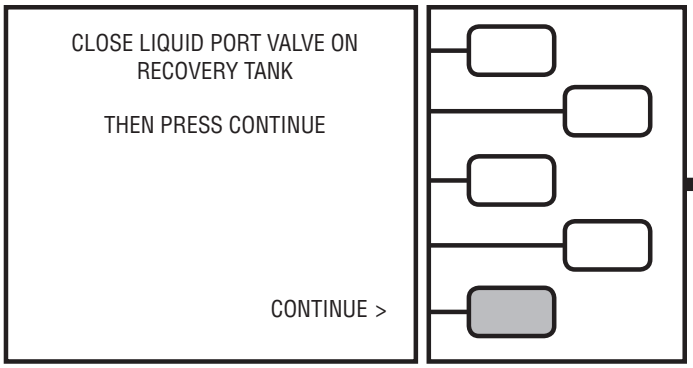
When the Filter Life reaches 0%, the following LCD screen will come up. Push the CHANGE FILTER key to begin filter change procedure. **(NOTE: pushing QUIT key at this time will return the unit to the Main Menu. All modes except RECOVER and FULL CYCLE are active. To unlock RECOVER and FULL CYCLE modes, complete the filter change procedure)**



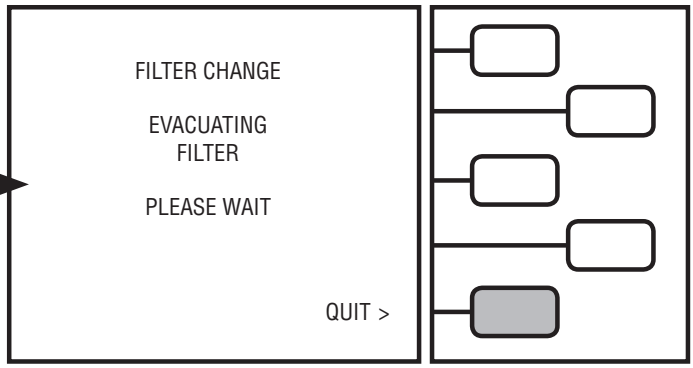
The LCD will now read:
Push the **START** key to begin Filter Change routine.



The LCD will now read:
After closing liquid port tank valve, push **CONTINUE** key

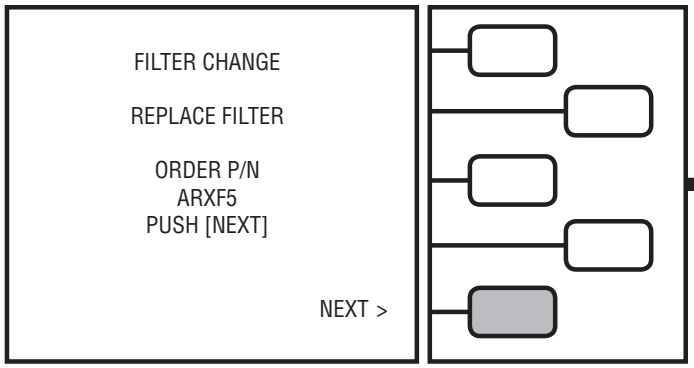


The LCD will now read:
The evacuation process will take about 2-5 minutes.
The unit will run until a filter has been evacuated.

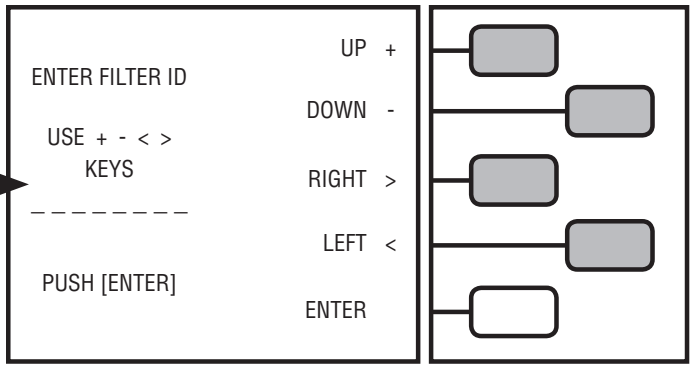


MAINTENANCE

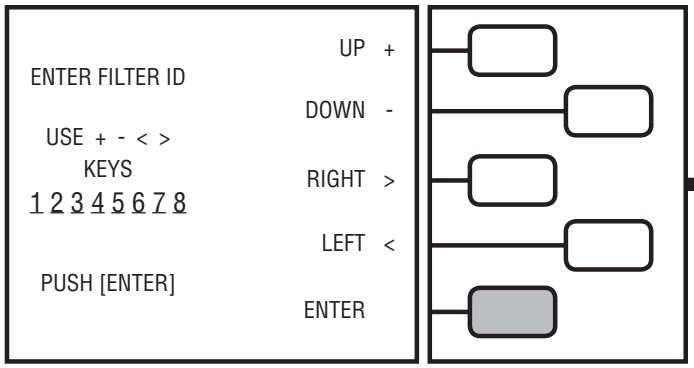
Once the filter has been evacuated, the LCD will read:
Replace the filter with new ARXF5.
Then Push the **NEXT** key:



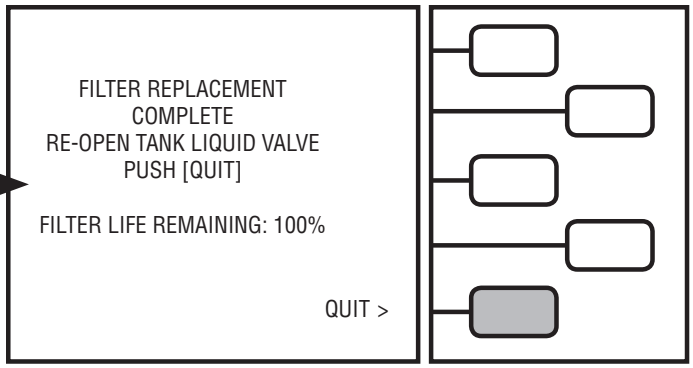
LCD will now read:
Use the +,-, KEYS to fill in the filter code for each blank.
Use the <,> KEYS to move cursor to the next blank
See filter label for code..



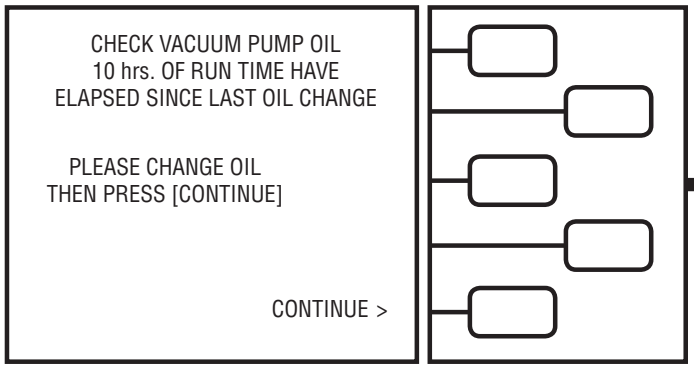
Push the **ENTER** key once the entire code is shown on LCD.



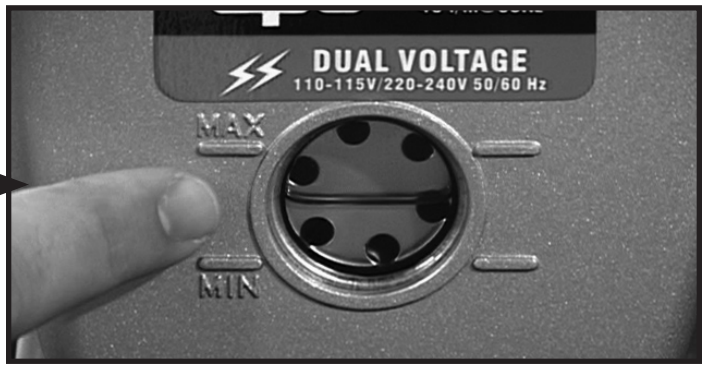
The LCD will now read:
Filter Change is now complete. Push the **QUIT** key to return to **MAIN MENU**.



VACUUM PUMP OIL: Every 10 hours of vacuum pump run time the following message will appear in **EVACUATION** or **FULL CYCLE** modes.

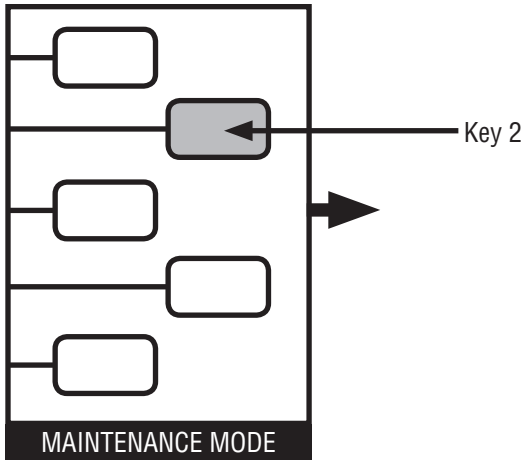


Check Vacuum Pump Oil: The oil level can be seen through the sight glass of the vacuum pump. To change the oil, first loosen the wing nut under the frame and then slide the vacuum pump out. The vacuum pump oil should be clear, use CPS vacuum pump oil p/n VPOP, VPOQ, VPOG. Make sure the oil level is up to the fill mark on the oil sight glass. Push **CONTINUE** key to proceed to the **EVACUATION** or **FULL CYCLE** modes.

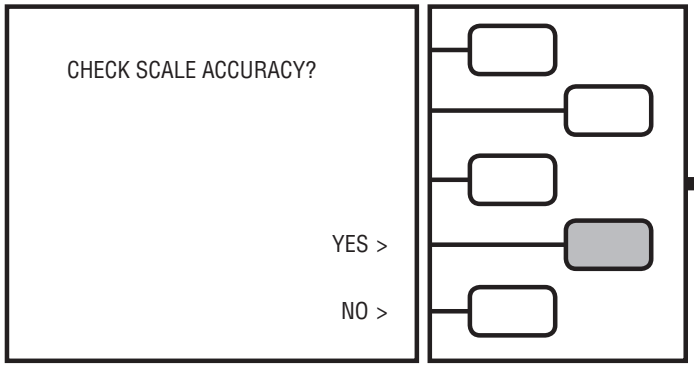


MAINTENANCE VIA KEYPAD OPERATION

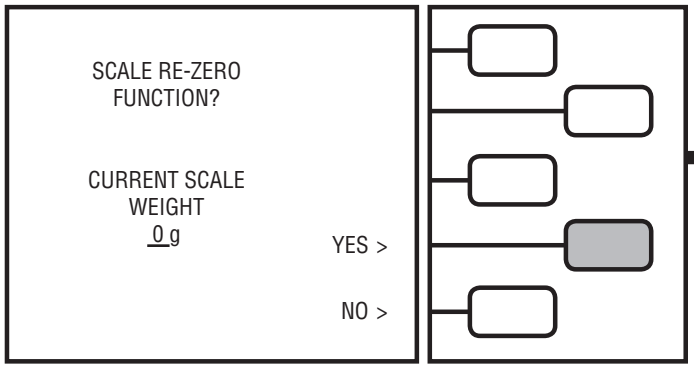
To enter into the units **MAINTENANCE** mode, hold down **Key 2** and then turn power switch on.



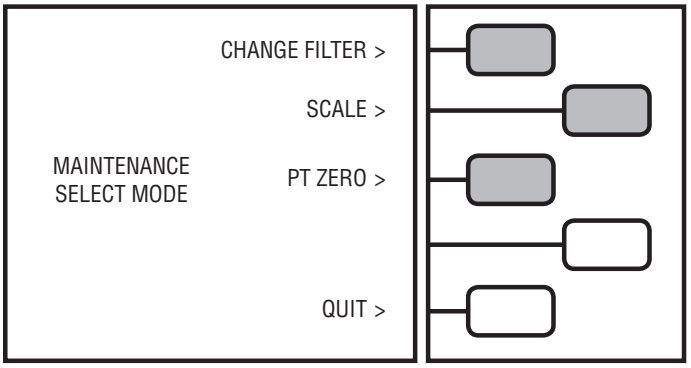
SCALE CHECK:
Push the **SCALE** key. The LCD will now read:
Push the **YES** key to proceed with accuracy check.
Pushing the **NO** key will skp the accuracy check and proceed to the **Re-Zeroing** function.



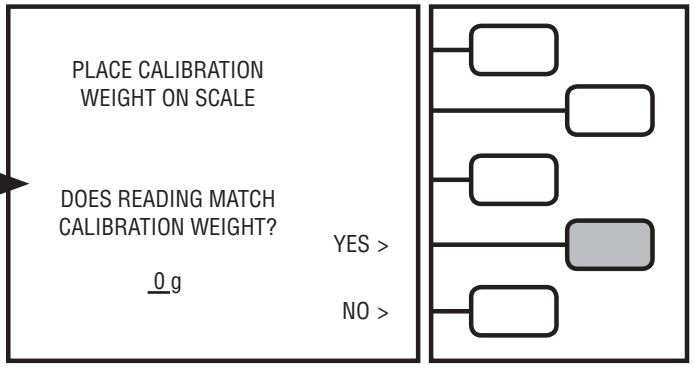
The LCD will now read:
Push the **YES** key to proceed with **RE-ZERO** scale.
Note: Pushing the NO key will prompt the unit to reboot and Go to MAIN MENU



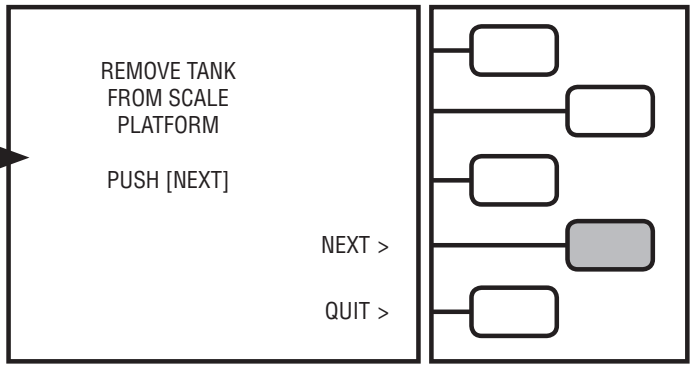
The LCD will now read:
FILTER CHANGE: Push the **CHANGE FILTER** key. Go to page 17 for detailed FILTER CHANGE instructions.



The LCD will now read:
Place Calibration Weight on tank.
Push the **YES** key if weight reading matches Calibration weight.
(Push the **NO** key if weight does not match. See service manual for complete scale re-calibration procedure. A 25LB or 15KG Class F weight will be required for scale re-calibration.)

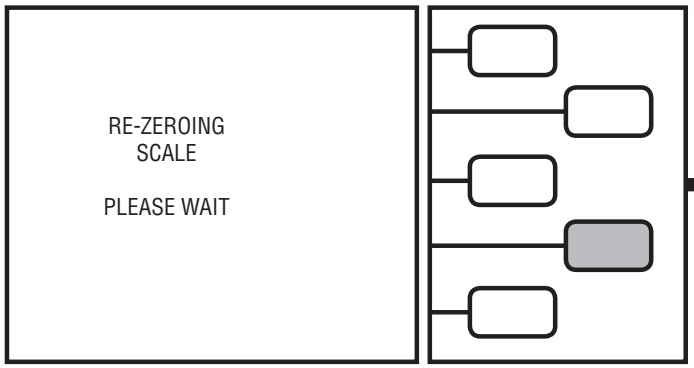


LCD will now read:
Lift the Tank off the scale.
Then Push **NEXT** key.



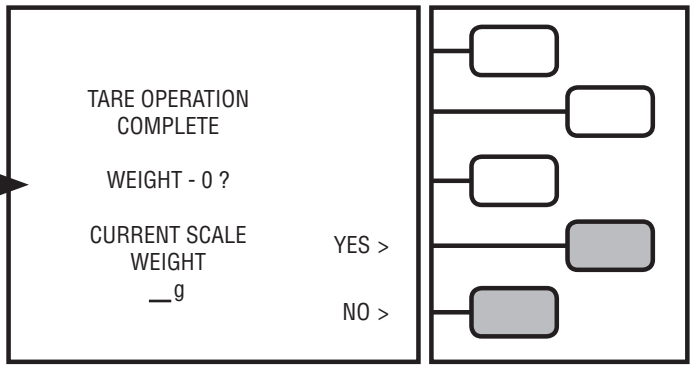
MAINTENANCE

The LCD will now read:
Wait until the LCD screen changes.



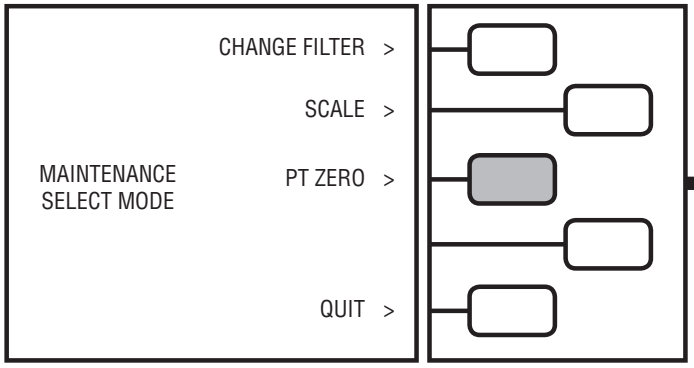
NOTE: Keep tank off scale platform

The LCD will now read:
Push the **YES** key if **CURRENT SCALE WEIGHT** is zero.
The unit will re-boot and go to the **MAIN MENU**.
Pushing the **NO** key will repeat Re-Zeroing process.

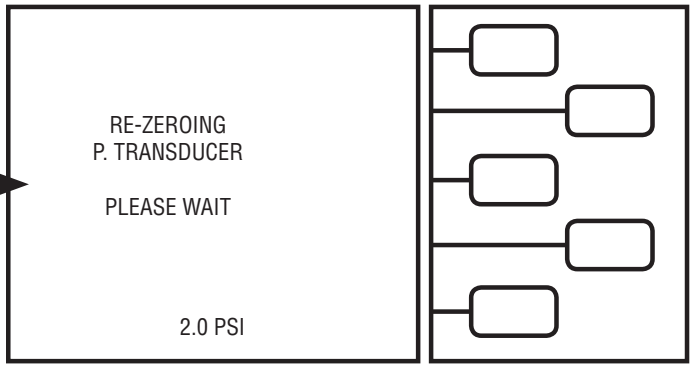


NOTE: Once complete place tank back on scale platform

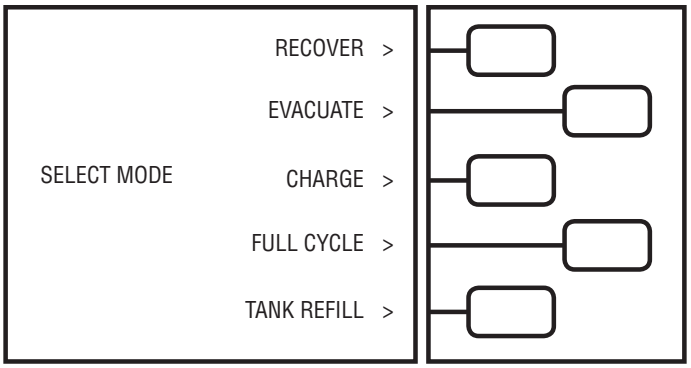
PT SENSOR/GAUGES:
Push the **PT SENSOR** key.
The AR2788S will begin a automatic routine
to reclibrate the Pressure Transducer (PT)



The LCD will now read:
Wait for Re-zeroing procedure to complete.



The Pressure Transducer (PT) calibration will automatically complete the procedure.
Once done, the LCD will return to the **Main Menu**:



Interconnection Hoses, Service Hoses and Coupler Maintenance

The AR2788S uses brass to brass seal type fittings on the ends of the interconnecting hoses. No hose gasket maintenance is required on brass to brass type of connections. Periodically inspect the refrigerant hose assembly, both service hose ends and both service couplers' inner o-ring. Replace the component(s) if excessive wear or leakage is observed.Periodically leak-check all hose connect points, hose ball valves, and service couplers. Since this unit does pull a vacuum in the recovery process, excessive Non-Condensable Gases (NCG's) could be sucked into the system and placed in the storage tank.

HIGH VOLTAGE A/C CHARGING INSTRUCTIONS

OEM manufacturers of Automotive High Voltage A/C systems have required that the residual amount of PAG oil in the charging hose(s) be reduced to a minimal level. The following are instructions on how to prepare the AR2788S for charging a High Voltage A/C system:

Step 1: Remove the oil injection assembly from the AR2788S. Cap off the port from which the oil injector was connected.

Step 2: Connect both **HI** and **LO** service hoses to the auxiliary fittings **(a-b)** on the hose between the filter and tank liquid port as shown in **Fig 3**.

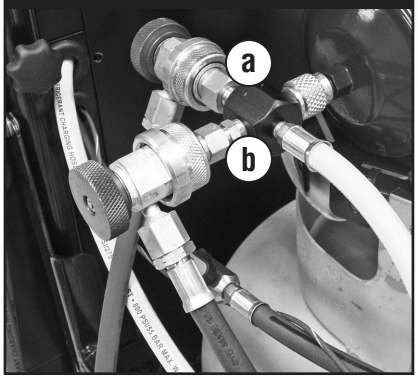
Step 3: Open both **HI** and **LO** service coupler valves.

Step 4: Push the **TANK REFILL** key from the **Main Menu**. Push the **START** key to begin a liquid flush of the hoses.

Step 5: Run for 2.5 Minutes. Then close **LO** service coupler. Run for additional 2.5 Minutes.

Step 6: Close both **HI** and **LO** service coupler valves. Remove couplers from auxiliary fittings. Allow the **TANK REFILL** mode to pull the service hoses into a vacuum and automatically shut off.

FIGURE - 3



Connect service hoses to auxillary ports on the liquid feed hose

The unit is now ready to charge a High Voltage A/C system. Following the CHARGING MODE instructions on page 12 to complete the recharge of the A/C system.

NOTE: When injecting oil back into a high voltage A/C system, use the OEM recommended oil. Use an oil injection system such as the CPS TLJ8 series with an OEM approved Hybrid Oil Cartridge. The cartridge and the injection hose should be dedicated for hybrid oil to prevent cross contamination with other oils.

TLJ8 Oil Injector

TROUBLE SHOOTING

Problem: High Pressure Limit.
Solution: Check that both Storage Tank valves are open. Check that any inline hose ball valves to the Storage Tank are open.

Problem: Tank Overfill.
Solution: Remove refrigerant from Storage Tank by charging into an empty refrigerant cylinder. If this does not fix the problem, then Re-Zero scale.

Problem: Unit not Charging accurately.
Solution: Make sure Storage Tank is properly placed on platform so that no portion of the tank is touching the back of the unit or protective frame work of the unit.
Solution: Do not move the unit while in the charging mode. The unit utilizes a weighing method of charging. Sudden movement of the storage tank will affect the charging accuracy.
Solution: Make sure unit is on a level surface. If placed on surface with more than 2% grade, the charging amount may be incorrect.

Problem: Unit will not power up.
Solution: Check to make sure power switch on the back of unit is ON.
Solution: Check to make sure circuit breaker on back of unit is not tripped. Reset and restart the unit if necessary.
Solution: Push the battery reset button on the back of the unit.
Solution: Make sure power cord is plugged into the back of the unit and the wall receptacle.

Problem: Upon compressor start up, the circuit breaker trips.
Solution: Reset circuit breaker and try again.

Problem: Upon vacuum pump start up, the circuit breaker trips.
Solution: Check Oil Level in vacuum pump. Reset circuit breaker and try again.
Solution: Make sure vacuum pump voltage switch is in the correct position.

For other problems, please call the CPS service network for further instructions.

SERVICE PARTS AND ACCESSORIES

ITEM	DESCRIPTION	ITEM	DESCRIPTION
AR2788SX1	AR2788S Low block complete	VPXF15	Vacuum pump fuse
AR2788SX2	AR2788S High block complete	VPXODP	Vacuum pump oil drain plug
AR2788SX3	AR2788S/AR2700/CS200 scale module	VPXOMP	Vacuum pump exhaust cap
AR2788SX4	AR2788S/AR2700 compressor assembly 115V	AVCVAC	Brass caps vacuum pump
AR2788SX5	AR2788S/AR2700 compressor assembly 230V	AR2788X14a	AR2788X 1/2" ACME tank refill adaptor
AR2788SX6	AR2788S/AR2700 compressor assembly 100V	AR2788X14b	AR2788X 1/4" SAE tank refill adaptor
AR2788SX7	AR2788S/AR2700 compressor	AR2788X16	AR2788X Low side gauge kit
AR2788SX8	AR2788S/AR2700 oil seperator assembly	AR2788X17	AR2788X High side gauge kit
AR2788SX9	AR2788S High side service hose	AR2788X18	AR2788X Low side charge adaptor
AR2788SX10	AR2788S Low side service hose	AR2788X25	AR2788X/CS200/AR2700 scale PCB
AR2788SX11	AR2788S liquid feed assembly	AR2788X28	AR2788X power supply
AR2788SX12	AR2788S discharge/filter hose assembly	AR2788X30	AR2788X 1lb. weight
AR2788SX13	AR2788S filter/tank hose/SAE “H” assembly	AR2788X32	AR2788X 15 AMP breaker 115 VAC
AR2788SX14	AR2788S vacuum pump hose assembly	AR2788X33	AR2788X 10 AMP breaker 240 VAC
AR2788SX15	AR2788S oil drain hose assembly	AR2788X34	AR2788X main power switch
AR2788SX16	AR2788S compressor suction hose assembly	AR2788X35	AR2788X key pad
AR2788SX17	Scale patch cord	AR2788X40	6 ft. power cord 115 VAC
AR2788SX18	Relay PCB patch cord	AR2788X41	6 ft. power cord 240 VAC (Europe)
AR2788SX19	Low side block PCB patch cord	AR2788X45	High pressure switch 450 PSI
AR2788SX20	High side block PCB patch cord	AR2788X46	AR2788X pressure transducer
AR2788SX21	AR2788S Low side block PCB	AR2788X51	AR2788X IEC main power inlet
AR2788SX22	AR2788S High side block PCB	AR2788X53	AR2788X IEC heater blanket outlet
AR2788SX23	AR2788S main PCB	AR2788X57	AR2788X gauge line repair kit
AR2788SX24	AR2788S LCD	AR2788X59	AR2788X magnetic door latch
AR2788SX25	AR2788S relay PCB	AR2788X63	AR2788X coupler storage fittings
AR2788SX26	AR2788S temperature sensor OS	AR2788X64	Castor w/ brake
AR2788SX27	AR2788S temperature sensor ambient	AR2788X65	10" wheel
AR2788SX28	AR2788S oil injection assembly	ARXF5	AR2788S coded 41 cu in filter
AR2788SX29	AR2788S/AR2700 filter bracket/straps	QCH134	High side service coupler
AR2788SX30	AR2788S/AR2700 oil drain bottle	QCL134	Low side service coupler
VP6D	Vacuum pump 6 CFM 2 stage	39-020	115V 6" Fan
VPXEP	Vacuum electrical plate	39-021	230V 6" Fan

AR2788S Accessories			
AR27XHB115	AR2788S 300W 115 VAC heater blanket	CRX390T	92 lb. recovery tank
AR27XHB230	AR2788S 300W 230 VAC heater blanket	40L	Europe recovery tank
CRX400T	50 lb. recovery tank		

WARRANTY & REPAIR POLICY / CONTACT INFORMATION

WARRANTY & REPAIR POLICY

CPS guarantees that the Mach 7 is free of manufacturing and material defects for one year. If a component should fail during the guarantee period, it will be repaired or replaced (at our option) at no charge. This guarantee does not apply to components that have been altered, misused, or returned solely in need of field service maintenance. This repair policy does not include components that are determined to be beyond economical repair. A component being returned for warranty repair must be accompanied by an original bill of sale and customer contact information.

The load cell assembly is guaranteed for three year period.
This equipment has been certified by ETL/ITS to meet or exceed:
SAE J2210, J2099 (AR2788)
UL 1963

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